

INFORMS

Number 7

Switch! Change to powder-free, low-allergen latex gloves – Experiences and recommendations from around the world.

The numerous health risks associated with glove powder have already moved many hospitals to eliminate powdered medical gloves completely. Sempermed informs about the hazards of the “deadly dust” and how they can be avoided.

Switch Experiences

Numerous hospitals have already followed the increasing recommendations by national and international health organisations to buy only powder-free, low-allergen gloves. After a period of change over several years, experiences are now available from various countries – here are some examples:



Germany

A nationwide campaign to change to powder-free gloves, conducted by BGW (organisation of professionals in the health and nursing services) resulted in a more than 50% annual decrease in latex allergies within a period of two years. Within the scope of this prevention campaign, so-called normative regulations were even introduced, which made the elimination of powdered latex gloves a legal requirement.

The “Latex Study Münster”, an interdisciplinary research project, showed the following results: After the switch to powder-free latex gloves, allergen concentrations in the



ambient air dropped to below the detection limit of 0.2 ng/m³ within 24 hours. A year later, allergic employees' IgE antibody levels were halved, they were free of symptoms, were able to discontinue their medication, and they were able to continue working in their profession at an allergen-free workplace.

Moreover there were no new cases of sensitisation. Today, approximately 90% powder-free gloves are used in German hospitals.



France

The university hospital in Rouen switched to powder-free gloves over a period of two years, and now uses 88% powder-free gloves. The university hospital in Montpellier decided to withdraw all powdered gloves and replace them with powder-free gloves. As a result, allergy symptoms

and sensitisation rates were reduced to a minimum. At an allergy centre in Paris, there were no new cases of latex sensitisation after two years of exclusive use of powder-free gloves.



Scandinavia

The Karolinska Institute in Stockholm has been pursuing a strict powder-free policy for a number of years, after a significant reduction in hand eczema, respiratory tract disorders and latex allergies was achieved among staff by creating a powder-free working environment.

At the Finnish university hospital in Tampere the switch to powder-free gloves resulted in a significant decrease in hand eczema and allergic phenomena, so that no member of staff had to change his or her occupation.

Today powder-free gloves are used almost exclusively in Sweden and Finland.



Canada

At the university hospital in Toronto the switch to powder-free gloves proved extremely effective in the prevention of latex allergies and did not result in any additional costs for the hospital.



USA

The Mayo Clinics in numerous federal states achieved a marked decrease in allergen concentrations in the entire hospital environment, and in new onsets, as well as a reduction of indirect costs by switching to powder-free gloves. A website was even launched, on which all powder-free hospitals in the USA (currently 120) are listed (www.deadlydust.com), in order to help sensitized patients to find safer institutions.

Reasons to Change

The most significant effect of eliminating powdered medical gloves is the higher degree of safety for staff, patients and visitors. In a powder-free, low-allergen environment, intolerance reactions and respiratory disorders among member of staff are reduced, sensitised employees can keep their jobs, and patients suffer fewer postoperative complications.

The long-term cost reduction is also significant, if you take the very high follow-up costs of powder damage into consideration (e.g. costs of recourse, sick leave, replacements, rehabilitation, retraining, extended hospital stays, second operations) – the costs of purchasing powder-free gloves are minimal by comparison.

Hazards of Glove Powder

There are no medical indications that require the use of powdered gloves. The frequently stated advantage that they are easier to don can also be achieved with other methods (e.g. with a synthetic lining as in Sempermed Supreme or Sempercare Edition), and the advantage of sweat absorption by the powder are in fact disadvantages. The

comprehensive list of powder hazards makes it easy to do without powdered medical gloves and certainly justifies their total elimination:

Skin damage

Powder draws moisture from the skin, abrades the epithelium and increases the pH of the skin. Cracked, dry and softened skin is susceptible to inflammations and eczema of the hands. Destruction of the natural skin protection layer makes it easier for allergens, toxins and pathogens to penetrate – irritative and allergic skin reactions (contact dermatitis) are facilitated.

Irritants

Glove powder not only irritates the skin, but also the conjunctiva and mucosa in the respiratory tract. If powder particles penetrate the lungs, bronchial spasms, asthma attacks and respiratory problems may occur.

Absorption and transport of allergens and endotoxins

Most glove components are water-soluble and are released by sweat and external fluids when the gloves are worn for a long period. (At this point it must be mentioned that powdered gloves generally contain greater quantities of chemicals and endotoxins, and powdered latex gloves usually have higher protein concentrations.) The glove powder binds and transports these substances, thus causing a wide variety of problems:

- *Skin irritation* (pseudo-allergic contact dermatitis) and type IV allergies (allergic contact dermatitis) are caused by glove chemicals (e.g. vulcanisation accelerators, anti-aging agents and process materials). Studies have shown that among employees in the health sector who react to latex gloves 40-50% suffer from irritative dermatitis and 10-20% suffer from type IV allergies. Irritations predispose to the development of a type IV allergy.
- *Type I allergies* (latex allergies) are caused by regular contact with natural latex proteins. Due to the possibly life-threatening consequences (anaphylactic shock), type I latex allergies are considerably more dangerous than type IV allergies. In the health profession latex allergies have increased significantly in the last decade and have reached an epidemic level (8-33%). Because of the numerous latex products in everyday life (household, toys, office, sports, clothing), allergic reactions must also be expected in patients, especially atopic patients and patients with cross-allergies. In children, more than 70% of anaphylactic reactions during operations are due to latex. Particularly in paediatrics,

but also neurosurgery, only powder-free synthetic gloves should be used.

- *Inflammations* can be caused by endotoxins (bacteria components that cause fever) that are deposited on various articles. They can also enhance allergies and accelerate sensitisation.

Increased exposure

In addition to direct contact with the user, powder-bound hazardous substances can also be released and propagated through glove perforations. As a result of movements when putting on and taking off powdered gloves, the powder particles contaminated with allergens and toxins escape into the ambient air, settle on clothing and instruments, penetrate open operation wounds and fall to the floor (from which they are agitated into the air again). Air conditioning systems and ventilators also promote the propagation of powder-bound substances, thus threatening an uncontrollably large group of people. The consequences are irritations, allergic reactions, sensitisation and postoperative complications.

Inhalative latex pollution

When powdered latex gloves are used, the allergen concentrations in the ambient air multiply: Depending on the number of gloves used and their protein/powder content, up to 1,000 ng/m³ have been measured (the threshold value for inhalative allergy onset is 0.6 ng allergen/m³ ambient air). The inhalation of airborne latex allergens can lead to both sensitization and the onset of allergic reactions, especially respiratory symptoms (30% of all people with a latex allergy develop respiratory symptoms).

Propagation of pathogens

Pathogen microbes can also adhere to the powder particles and be transmitted in this manner. This results in an increased infection risk for medical staff and patients – whether in routine examinations, emergencies or the treatment of wounds.

Postoperative complications

Up to four million powder particles can remain in a surgical wound and trigger a foreign-body reaction. This in turn can result in inflammation, infection, delayed wound healing,

increased scarring and reduced immune defence. In addition, powder particles can leave granulomas behind, which can still form adhesions years after (particularly after abdominal surgery). The established practice of washing gloves does not reduce these risks – on the contrary: as a result the powder particles become lumpy and cause more intensive tissue reactions.

Such postoperative complications extend the duration of hospital stays and increase the costs. In some cases, a second operation

(60-80% of all bowel occlusions and 15-20% of all cases of infertility are due to adhesions associated with foreign bodies) or unnecessary biopsy (when granulomas mask carcinomas) may be required.

Here again it is the dusty consistency of the powder that allows the powder particles to penetrate tissue or an open surgical wound by various routes: via direct tissue contact with the powdered glove, via surgical instruments, through glove perforations, via the respiratory tract (e.g. during intubation), or as fallout from the ambient air.

Contamination of medical equipment

Medical instruments and devices can also be contaminated when handled with powdered gloves or by airborne powder particles, thus endangering the patient. The optimal performance of high-tech instruments (e.g. endoscopic cameras, surgical microscopes, monitors) can be impaired by powder deposits.

Impairment of diagnostic tests

Airborne powder particles can contaminate lab samples, resulting in incorrect test results.



Reasons for powder-free gloves

Powder-free medical gloves generally contain fewer chemicals and endotoxins, and powder-free latex gloves also contain fewer proteins. As a result they are significantly less allergenic and more skin tolerable. By using powder-free gloves, all powder-related health risks can be eliminated and costs reduced in the long term.

Official Recommendations and Instructions

Numerous national and international health organisations have studied the risks of powder (particularly in connection with latex allergies) and issued recommendations for prevention. The quintessence of the generally uniform recommendations by the European Commission, national health authorities (Germany and Austria) and allergology associations through to the American health authority FDA is as follows:

- use powder-free gloves with a low protein and chemical content (without thiurames) for the primary and secondary prevention of allergies (type I or IV)
- limit the use of latex gloves to specific infection prevention, and use powder-free latex gloves for this purpose
- where the infection risk is low, use synthetic gloves (e.g. for nursing tasks)
- create an allergen-free environment to minimize exposure: clean workplaces contaminated by airborne allergens frequently (incl. the replacement of ventilation filters and vacuum cleaner bags)
- perform laparoscopies where possible
- create a safe treatment environment for the treatment of allergic patients and keep foreign bodies away from the surgical area (by using powder-free gloves)
- to avoid new cases of sensitization, replace powdered gloves and purchase only powder-free, low-allergen gloves
- individuals with an existing latex allergy must wear synthetic gloves and avoid any direct or indirect contact with latex gloves (recommended at the first suspicion of a latex allergy)
- to avoid life-threatening allergic shock reactions, reduce the exposure risk: provide synthetic gloves for people with a latex allergy and provide powder-free latex gloves to prevent the inhalation risk
- educate all members of staff regarding powder risks and latex allergies
- perform a regular allergy screening of all employees and identify the allergy risk groups
- record latex history routinely prior to every operation in order to identify risk patients
- Change gloves at regular intervals and on the slightest suspicion of micro-perforation (even during an operation)
- always dry your hands properly after washing them, use gentle soaps, use hand care products consistently
- manufacturers must reduce water-soluble proteins and chemicals, if side effects for patients and users must be

expected recommended limit value to reduce the risk of latex allergies: <30 µg protein / g glove (58% of all allergic persons react positively to 50 µg/g in the prick test)

- gloves labeled as “powder-free” must not exceed a residual powder content of 2 mg (residues are inevitable when powder is used as a process material)
- German legislation has banned the use of powdered latex gloves by law due to their hazardous nature (with penal and liability consequences).

Safety Requirements for Medical Gloves

Members of the health professions are exposed to various hazards, many of which can be avoided by taking specific measures. Within the scope of safety measures, medical gloves play a key role. On the one hand they must provide complete **infection protection** (Sempermed medical gloves are classified as “virus proof”), and on the other hand they must be **comfortable to wear**. They certainly should not present any additional health risks or – worse still – result in an inability to work. Therefore a high value must be placed on top quality, both by the purchasers and users, and by the manufacturers – Sempermed conducts the most stringent **safety and quality controls** and guarantees compliance with the relevant standards. The **glove material** chosen depends primarily on the task at hand. No other material can match the unique properties of natural latex, but innovative combinations of natural latex and synthetics/synthetic rubber are very promising. However, due to the significant increase in latex allergies, particularly with regard to powder, latex gloves must be viewed critically. Sempermed uses only carefully selected raw materials and does everything in its power to reduce latex proteins to a minimum with multiple washing processes. Instead of being powdered, *Sempermed Supreme* (surgical glove) and *Sempercare Edition* (examination glove) are finished with a patented **synthetic inner coating**. This combination of natural latex and synthetics makes the gloves easy to don and protects from skin damage. The **powder-free, low-protein** and **low-irritant** gloves *Sempermed Supreme* and *Sempercare Edition* offer maximum safety and quality and are particularly good value for money.

Conclusion

Medical gloves are indispensable as a protection from infections. In view of the dermatological, allergological and toxic health risks associated with glove powder, users and purchasers should choose powder-free, low-allergy gloves.

Print Information

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